UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/796,774	03/09/2004	L. Peter Deutsch	1232	1652

7590 09/08/2006

ALLAN J. JACOBSON
13310 Summit Square Center
Route 413 & Doublewoods Road
Langhorne, PA 19047

EXAMINER	
VAUTROT, DENNIS L	
ART UNIT	PAPER NUMBER
2167	

DATE MAILED: 09/08/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/796,774	DEUTSCH ET AL.	
	Examiner	Art Unit	
	Dennis L. Vautrot	2167	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *3/9/2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-26* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-26* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *09 March 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1, 2, 7, and 11 are rejected under 35 U.S.C. 102(b) as being anticipated by **Downs et al.** (hereinafter, **Downs**, US 6,067,553).

3. Regarding claim 1, **Downs** discloses a method for processing an Arbitrary Order Signal Sequence having a plurality of Objects and a plurality of Object References between said plurality of Objects [PDF standard], said method transforming said Arbitrary Order Signal Sequence [PDF] into a Streamable Signal Sequence [different structure] (See column 8, lines 57-63 "...and thus all object definitions within the file, before any of the object references can be used to draw an image on a graphical display unit. However, FIG. 7 shows an apparatus for re-organizing existing PDF files structured in the manner indicated in FIG. 5, into a file having a different structure, yet which remains compliant with the PDF standard." The "different structure" referred to is

explained in greater detail and is clearly a Streamable Signal Sequence.), said method comprising:

determining a network of references between said plurality of Objects, said step of determining including identifying at least one Referenced Object [212] and a corresponding Referencing Object [211] containing an Object Reference to said Referenced Object [212] (See column 6, lines 52-57 "The catalogue object 211 contains references to other objects, such that the layout of the file's contents is defined. In the example shown, the catalogue object 211 contains a reference to another object 212, which in turn contains a reference to several page objects 213, 214, and 215..."); and

placing said Referenced Object in said Streamable Signal Sequence prior to said corresponding Referencing Object, responsive to said determining step, to form said Streamable Signal Sequence. (See column 10, lines 39-43 "If the PDF statement is a reference to an object or a page, control is directed to process 854, where a question is asked as to whether the object or page has already been defined. If there is no existing definition for the object or page in the destination file, it will be necessary to define it before further progress is made." Defining the definition for the object, when it has not been defined previously, is equivalent to placing the referenced object prior to the referencing object.)

4. Regarding claim 2, **Downs** discloses said Referenced Object [font object] is a Shared Referenced Object that has a first Object Reference from a first Referencing Object and a second Object Reference from a second Referencing Object to said

Shared Referenced Object (See column 12, lines 3 – 5 "Furthermore, objects defined within a page, such as a font object, need only be defined once in a while, and thereafter used in any page within that file." Any of the other objects in the file that reference the font object would be a first or second referencing object.) said method further comprising:

identifying said Shared Referenced Object [font] and said corresponding first Referencing Object and said second Referencing Object (See column 12, lines 3 – 5 "Furthermore, objects defined within a page, such as a font object, need only be defined once in a while, and thereafter used in any page within that file." Any of the other objects in the file that reference the font object would be a first or second referencing object.); and

placing [defined before] said Shared Referenced Object [page 213] in said Streamable Signal Sequence prior [defined before] to either of said first Referencing Object and said second Referencing Object to form said Streamable Signal Sequence. (See column 11, lines 58-61 "Reading from the start of the file shown in FIG. 11, it may be seen that definitions of objects which are referred to in page definition 213 are defined before page 213." By defining them before, the object is placed prior in the signal sequence.)

5. Regarding claim 7, **Downs** discloses generating identification Summary Information to identify said Streamable Signal Sequence (See column 7, lines 28 – 31 "Each object, such as the catalogue 211, page definitions 213 to 215 and other objects

are stored in the file one after the other. The sequential nature of the file structure requires the use of a cross-reference table 'xref' 501..." The xref table has the identification for all of the objects in the sequence.); and inserting said identification Requirement Summary Information into said Streamable Signal (See figure 5, item 501, showing the location of the identification summary information within the file stream.)

6. Regarding claim 11, **Downs** discloses generating Summary Information regarding at least one of said Referenced Object [211] and said Referencing Object, wherein said Summary Information is a PDF xref table (See column 7, lines 28 – 31 "Each object, such as the catalogue 211, page definitions 213 to 215 and other objects are stored in the file one after the other. The sequential nature of the file structure requires the use of a cross-reference table 'xref' 501..." The xref table has the identification for all of the objects in the sequence.); and inserting said Summary Information into said Streamable Signal Sequence. (See figure 5, item 501, showing the location of the identification summary information within the file stream.)

7. Claim 25 is rejected under 35 U.S.C. 102(e) as being anticipated by **Vondran, JR et al.** (hereinafter **Vondran**, US 2005/0094191). **Vondran** discloses a method for processing a Streamable Signal Sequence having a plurality of Objects and a plurality of Object References between said plurality of Objects and including at least one non-shared Referenced Object [number of uses for this object = 1] and a corresponding Referencing Object containing an Object Reference to said non-shared Referenced

Object, said Streamable Signal Sequence further having said non-shared Referenced Object in said Streamable Signal Sequence placed prior to [top of the list] said corresponding Referencing Object. (See page 3, paragraph [0027] "Each link is assigned a weight based on, for example, the number and/or size of the common objects between the link's two page nodes.", and see page 4, paragraph [0029] "a first link entry is selected and evaluated to determine whether its combined end node's page lists do not exceed the maximum partition size....If the number of clusters is less than the value held in partitions at step 90, then the numbers of clusters is incremented at step 91." and see page 4, paragraph [0031] "repositioning of the updated links involves sorting from the currently selected link's position upward towards the top of the list."); said Streamable Signal Sequence further including Last Reference Summary Information [field] about said non-shared Referenced Object [number of uses for this object = 1] identifying said Referencing Object in the Streamable Signal Sequence as corresponding to the last Referencing Object Signal [references] containing an Object Reference to said non-shared Referenced Object (See Vondran page 3, paragraph [0025] "...extend the object table 36 to include a field associated with each unique entry (object) that holds a count of the number of occurrences of each unique entry encountered during the pre-processing of a print job or jobs. This corresponds to the number of uses of each unique object. From this reuse information, the caching mechanism can make determinations as to the object caching priorities based on the number of uses and which objects may be drop from the cache because they have no further references."),

said method comprising: receiving [holds a count] said non-shared Referenced Object and said Last Reference Summary Information; storing said non-shared Referenced Object in a memory; processing said Referencing Object [pre-processing] containing said Object Reference to said non-shared Referenced Object; (See Vondran page 3, paragraph [0025] "...extend the object table 36 to include a field associated with each unique entry (object) that holds a count of the number of occurrences of each unique entry encountered during the pre-processing of a print job or jobs. This corresponds to the number of uses of each unique object. From this reuse information, the caching mechanism can make determinations as to the object caching priorities based on the number of uses and which objects may be drop from the cache because they have no further references."); and deleting [dropped from the cache], responsive to Last Reference Summary Information, said non-shared Referenced Object from said memory (See page 3, paragraph [0025] "...objects may be dropped from the cache because they have no further references.")

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

9. Claims 3 – 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Downs** as applied to claim 1 above, and further in view of **Vondran, JR et al.** (hereinafter **Vondran**, US 2005/0094191).

10. Regarding claim 3, **Downs** discloses a method substantially as claimed. **Downs** fails to disclose generating Last Reference Summary Information about said Shared Referenced Object identifying the last of said first Referencing Object and said second Referencing Object in said Streamable Signal Sequence as corresponding to the last Referencing Object Signal containing an Object Reference to said Referenced Object; and inserting said Last Reference Summary Information into said Streamable Signal Sequence.

However, **Vondran** discloses generating Last Reference Summary Information [field] about said Shared Referenced Object identifying the last of said first Referencing Object and said second Referencing Object in said Streamable Signal Sequence as corresponding to the last Referencing Object Signal [references] containing an Object Reference to said Referenced Object; and inserting said Last Reference Summary Information into said Streamable Signal Sequence [cache]. (See Vondran page 3, paragraph [0025] "...extend the object table 36 to include a field associated with each unique entry (object) that holds a count of the number of occurrences of each unique entry encountered during the pre-processing of a print job or jobs. This corresponds to the number of uses of each unique object. From this reuse information, the caching mechanism can make determinations as to the object caching priorities based on the

number of uses and which objects may be drop from the cache because they have no further references.")

The motivation to combine the references comes from the common goal of modifying data streams for faster printing. It would have been obvious to one with ordinary skill in the art at the time of the invention to include the teachings of **Vondran** because by knowing when the last reference has been made to the object, the object can be removed, allowing for space to be freed up for other objects. It is for this reason that one of ordinary skill in the art would have been motivated to include generating Last Reference Summary Information about said Shared Referenced Object identifying the last of said first Referencing Object and said second Referencing Object in said Streamable Signal Sequence as corresponding to the last Referencing Object Signal containing an Object Reference to said Referenced Object; and inserting said Last Reference Summary Information into said Streamable Signal Sequence.

11. Regarding claim 4, **Downs** discloses a method substantially as claimed. **Downs** fails to disclose said Referenced Object is a non-shared referenced Object, said method further comprising: generating Last Reference Summary Information about said Referenced Object identifying said Referencing Object in the Streamable Signal Sequence as corresponding to the last Referencing Object Signal containing an Object Reference to said Referenced Object; and inserting said Last Reference Summary Information into said Streamable Signal Sequence.

However, **Vondran** discloses said Referenced Object is a non-shared referenced Object [number of uses for this object = 1], said method further comprising: generating Last Reference Summary Information [field] about said Referenced Object identifying said Referencing Object in the Streamable Signal Sequence as corresponding to the last Referencing Object Signal [references] containing an Object Reference to said Referenced Object; and inserting said Last Reference Summary Information into said Streamable Signal Sequence. (See Vondran page 3, paragraph [0025] "...extend the object table 36 to include a field associated with each unique entry (object) that holds a count of the number of occurrences of each unique entry encountered during the pre-processing of a print job or jobs. This corresponds to the number of uses of each unique object. From this reuse information, the caching mechanism can make determinations as to the object caching priorities based on the number of uses and which objects may be drop from the cache because they have no further references.")

The motivation to combine the references comes from the common goal of modifying data streams for faster printing. It would have been obvious to one with ordinary skill in the art at the time of the invention to include the teachings of **Vondran** because by knowing when the last reference has been made to the object, the object can be removed, allowing for space to be freed up for other objects. It is for this reason that one of ordinary skill in the art would have been motivated to include said Referenced Object is a non-shared referenced Object, said method further comprising: generating Last Reference Summary Information about said Referenced Object identifying said Referencing Object in the Streamable Signal Sequence as

corresponding to the last Referencing Object Signal containing an Object Reference to said Referenced Object; and inserting said Last Reference Summary Information into said Streamable Signal Sequence.

12. Regarding claim 5, **Downs** discloses a method substantially as claimed. **Downs** fails to disclose wherein said Referenced Object is a non-shared Referenced Object from a corresponding Referencing Object, where said Referencing Object has an Object Reference from said Referencing Object to said Referenced Object, said method further comprising: said step of determining said network of references between said plurality of Objects, further includes the step of identifying the size of the portion of said Referencing Object following said Object Reference to said non-shared Referenced Object; and placing said Referenced Object in said Streamable Signal Sequence prior to said corresponding Referencing Object if said Referenced Object is smaller than said portion of said Referencing Object following said Object Reference to said non-shared Referenced Object, and placing said Referenced Object in said Streamable Signal Sequence after its corresponding Referencing Object if said Referenced Object is larger than said portion of said Referencing Object following said Object Reference to said non-shared Referenced Object, to form said Streamable Signal Sequence.

However, **Vondran** discloses wherein said Referenced Object is a non-shared Referenced Object from a corresponding Referencing Object, where said Referencing Object has an Object Reference from said Referencing Object to said Referenced Object, said method further comprising: said step of determining said network of

references between said plurality of Objects, further includes the step of identifying the size of the portion [size of the common objects] of said Referencing Object following said Object Reference to said non-shared Referenced Object; and placing said Referenced Object in said Streamable Signal Sequence prior to [top of the list] said corresponding Referencing Object if said Referenced Object is smaller than said portion of said Referencing Object following said Object Reference to said non-shared Referenced Object, and placing said Referenced Object in said Streamable Signal Sequence after its corresponding Referencing Object [incremented] if said Referenced Object is larger than said portion of said Referencing Object following said Object Reference to said non-shared Referenced Object, to form said Streamable Signal Sequence. (See page 3, paragraph [0027] "Each link is assigned a weight based on, for example, the number and/or size of the common objects between the link's two page nodes.", and see page 4, paragraph [0029] "a first link entry is selected and evaluated to determine whether its combined end node's page lists do not exceed the maximum partition size....If the number of clusters is less than the value held in partitions at step 90, then the numbers of clusters is incremented at step 91." and see page 4, paragraph [0031] "repositioning of the updated links involves sorting from the currently selected link's position upward towards the top of the list.")

The motivation to combine the references comes from the common goal of modifying data streams for faster printing. It would have been obvious to one with ordinary skill in the art at the time of the invention to include the teachings of **Vondran** because the size restraints will only allow for the objects to be placed before if the

object is small enough to fit there. It is for this reason that one of ordinary skill in the art would have been motivated to include wherein said Referenced Object is a non-shared Referenced Object from a corresponding Referencing Object, where said Referencing Object has an Object Reference from said Referencing Object to said Referenced Object, said method further comprising: said step of determining said network of references between said plurality of Objects, further includes the step of identifying the size of the portion of said Referencing Object following said Object Reference to said non-shared Referenced Object; and placing said Referenced Object in said Streamable Signal Sequence prior to said corresponding Referencing Object if said Referenced Object is smaller than said portion of said Referencing Object following said Object Reference to said non-shared Referenced Object, and placing said Referenced Object in said Streamable Signal Sequence after its corresponding Referencing Object if said Referenced Object is larger than said portion of said Referencing Object following said Object Reference to said non-shared Referenced Object, to form said Streamable Signal Sequence.

13. Claims 6, 9, and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Downs** as applied to claim 1 above, and further in view of **Kuroki** (US 2004/0100656).

14. Regarding claim 6, **Downs** discloses a method substantially as claimed. **Downs** fails to disclose generating Memory Requirement Summary Information regarding the

amount of memory required to process said Streamable Signal Sequence; and inserting said Memory Requirement Summary Information into said Streamable Signal. However, **Kuroki** discloses generating Memory Requirement Summary Information [size of the PDF after conversion] regarding the amount of memory required to process said Streamable Signal Sequence [converted PDF file] (See page 5, paragraph [0080] "Next, the size of the PDF after the conversion process is compared with the usable capacity of the memory of the printer 200, which is to be used for printing the PDF file..."); and inserting said Memory Requirement Summary Information into said Streamable Signal (See figure 21, item 502F, showing the summary information within the stream of data). It would have been obvious to one with ordinary skill in the art at the time of the invention to combine **Downs** with **Kuroki** because they are both in the field of optimizing data streams relating to PDF files and by adding memory summary information as disclosed in **Kuroki** to the stream, a data overrun can be avoided providing for a more fault tolerant method. It is for this reason that one of ordinary skill in the art would have been motivated to include generating Memory Requirement Summary Information regarding the amount of memory required to process said Streamable Signal Sequence; and inserting said Memory Requirement Summary Information into said Streamable Signal.

15. Regarding claim 9, **Downs** discloses said Arbitrary Order Signal sequence is a Portable Document Format (PDF) file. (See column 8, lines 57-63 "...and thus all object definitions within the file, before any of the object references can be used to draw an

image on a graphical display unit. However, FIG. 7 shows an apparatus for re-organizing existing PDF files structured in the manner...").

Downs fails to disclose, said method further comprising: generating identification Summary Information to identify said Streamable Signal Sequence as a streamable PDF file; and inserting said identification Summary Information into said Streamable Signal.

However, **Kuroki** discloses said method further comprising: generating identification Summary Information [PDF.1.4] to identify said Streamable Signal Sequence as a streamable PDF file; and inserting said identification Summary Information into said Streamable Signal. (See FIG. 5, item 510 where the identification information, is shown located at the top of the streamable signal.) It would have been obvious to one with ordinary skill in the art at the time of the invention to combine **Downs** with **Kuroki** because they are both in the field of optimizing data streams relating to PDF files and by adding identification information as disclosed in **Kuroki** to the stream, the receiving device can still recognize the data as a PDF format, allowing for compatibility. It is for this reason that one of ordinary skill in the art would have been motivated to include said method further comprising: generating identification Summary Information [PDF.1.4] to identify said Streamable Signal Sequence as a streamable PDF file; and inserting said identification Summary Information into said Streamable Signal.

16. Regarding claim 10, **Downs** additionally discloses each of said Objects are PDF objects, and said each of said Object References is a PDF object is a PDF Object Identifier. (See column 10, lines 51-57 "If, at process 853, an object or page reference is not identified, control is directed to process 856, where a question is asked as to whether the current PDF statement defines the end of an object or page definition...Alternatively, control is directed to process 857, where the object or page identifier is written to the object cross reference table." Here, the source refers to the objects as PDF statements, and also refers to the object identifier.)

17. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over **Downs** as applied to claim 1 above, and further in view of **Rowe et al.** (hereinafter Rowe, US 5,781,785). **Downs** discloses a method substantially as claimed. **Downs** fails to disclose generating non-shared Summary Information to indicate that all Objects in said Streamable Signal Sequence are non-shared and inserting said non-shared Summary Information into said Streamable Signal. However, **Rowe** discloses generating non-shared Summary Information [internal list] to indicate that all Objects in said Streamable Signal Sequence are non-shared (See column 3, lines 40-43 "To provide the page contents and shared objects contiguously in the file, an internal list of non-shared objects and shared objects in the document file is created."); and inserting said non-shared Summary Information into said Streamable Signal. (See column 15, lines 29-34 "If the retrieved object is not a shared object...the object ID of the retrieved object is added to the end of the internal list. The internal list thus has an order of objects

including a page object followed b all the objects (in the designated order) referenced by that page.") It would have been obvious to one with ordinary skill in the art at the time of the invention to combine **Downs** with **Rowe** because they are both in the field of optimizing data streams relating to PDF files and by including a list of non-shared objects as disclosed in **Rowe** to the stream, storage can be saved by removing them as soon as they are used. It is for this reason that one of ordinary skill in the art would have been motivated to include disclose generating non-shared Summary Information to indicate that all Objects in said Streamable Signal Sequence are non-shared and inserting said non-shared Summary Information into said Streamable Signal.

18. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over **Downs et al.** (hereinafter, **Downs**, US 6,067,553) in view of **Kuch et al.** (hereinafter, **Kuch**, US 6,862,729). **Downs** discloses a method for processing an Arbitrary Order Signal Sequence having a plurality of Objects and a plurality of Object References between said plurality of Objects, said method transforming said Arbitrary Order Signal Sequence into a Streamable Signal Sequence (See column 8, lines 57-63 "...and thus all object definitions within the file, before any of the object references can be used to draw an image on a graphical display unit. However, FIG. 7 shows an apparatus for re-organizing existing PDF files structured in the manner indicated in FIG. 5, into a file having a different structure, yet which remains compliant with the PDF standard." The "different structure" referred to is explained in greater detail and is clearly a Streamable Signal Sequence.), said method comprising: determining a network of references

between said plurality of Objects, said step of determining including identifying at least one Referenced Object and a corresponding Referencing Object containing an Object Reference to said Referenced Object (See column 6, lines 52-57 "The catalogue object 211 contains references to other objects, such that the layout of the file's contents is defined. In the example shown, the catalogue object 211 contains a reference to another object 212, which in turn contains a reference to several page objects 213, 214, and 215...").

Downs fails to teach splitting said Referencing Object into a first Referencing Object and a second Referencing Object such that the Object Reference to said Referenced Object is at the end of said first Referencing Object; and placing said Referenced Object between said first Referencing Object and said second Referencing Object created by said step of splitting said Referencing Object in said Streamable Signal Sequence.

However, **Kuch** teaches splitting said Referencing Object into a first Referencing Object and a second Referencing Object such that the Object Reference to said Referenced Object is at the end of said first Referencing Object (See column 15, line 66 – column 16 line 6 "A simple splitting technique simply specifies a threshold (e.g., percentage of references) and splits the data members of a class into two groups: A hot group and a cold group. If the profiling data indicates a particular data member has at least the threshold (e.g., percentage of the references), it is placed in the hot group; data members having less than the threshold...are placed in the cold group."); and placing said Referenced Object between [in the same group] said first Referencing

Object and said second Referencing Object created by said step of splitting said Referencing Object in said Streamable Signal Sequence (See column 12, lines 57-60 "During execution, the class loader 812 arranges data members of the object in the memory system 822 by placing data members in the same group at neighboring locations in the memory system.")

It would have been obvious to one with ordinary skill in the art at the time of the invention to combine **Downs** with **Kuch** because they are both in the field of optimizing arrangements of objects and by including splitting the object and inserting into the data stream as disclosed in **Kuch**, the method can become more efficient because the objects are grouped together, closer to their referencing object. It is for this reason that one of ordinary skill in the art would have been motivated to include splitting said Referencing Object into a first Referencing Object and a second Referencing Object such that the Object Reference to said Referenced Object is at the end of said first Referencing Object; and placing said Referenced Object between said first Referencing Object and said second Referencing Object created by said step of splitting said Referencing Object in said Streamable Signal Sequence.

19. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over **Downs et al.** (hereinafter, **Downs**, US 6,067,553) in view of **Gall** (US 6,480,862). **Downs** discloses a method for processing an Arbitrary Order Signal Sequence having a plurality of Objects and a plurality of Object References between said plurality of Objects, said method transforming said Arbitrary Order Signal Sequence into a

Streamable Signal Sequence (See column 8, lines 57-63 "...and thus all object definitions within the file, before any of the object references can be used to draw an image on a graphical display unit. However, FIG. 7 shows an apparatus for re-organizing existing PDF files structured in the manner indicated in FIG. 5, into a file having a different structure, yet which remains compliant with the PDF standard." The "different structure" referred to is explained in greater detail and is clearly a Streamable Signal Sequence.), said method comprising: determining a network of references between said plurality of Objects, said step of determining including identifying at least one Referenced Object and a corresponding Referencing Object containing an Object Reference to said Referenced Object (See column 6, lines 52-57 "The catalogue object 211 contains references to other objects, such that the layout of the file's contents is defined. In the example shown, the catalogue object 211 contains a reference to another object 212, which in turn contains a reference to several page objects 213, 214, and 215...").

Downs fails to teach replicating said Referenced Object into a first replicated Referenced Object and a second Referenced Object; placing said first replicated Referenced Object in said Streamable Signal Sequence prior to said first Referencing Object in said Streamable Signal Sequence; and placing said second replicated Referenced Object in said Streamable Signal Sequence prior to said second Referencing Object in said Streamable Signal Sequence.

However, **Gall** teaches replicating said Referenced Object into a first replicated Referenced Object and a second Referenced Object; placing said first replicated

Referenced Object in said Streamable Signal Sequence prior to said first Referencing Object in said Streamable Signal Sequence; and placing said second replicated Referenced Object in said Streamable Signal Sequence prior to said second Referencing Object in said Streamable Signal Sequence. (See column 13, line 66 – column 14, line 5 "Block 226 handles the objects in the "order" list, essentially copying the objects referenced by each object in the "order" list into the To partition in the access order defined by the access order tree. In addition, at this time, a forwarding pointer is added to each original object in the From partition, which points to the new copy of that object in the To partition.")

It would have been obvious to one with ordinary skill in the art at the time of the invention to combine **Downs** with **Gall** because they are both in the field of optimizing data objects and by including replicating the object and inserting into the data stream as disclosed in **Gall**, the method can become more efficient (although taking up more space) because the objects are closer to their referencing object. It is for this reason that one of ordinary skill in the art would have been motivated to include replicating said Referenced Object into a first replicated Referenced Object and a second Referenced Object; placing said first replicated Referenced Object in said Streamable Signal Sequence prior to said first Referencing Object in said Streamable Signal Sequence; and placing said second replicated Referenced Object in said Streamable Signal Sequence prior to said second Referencing Object in said Streamable Signal Sequence.

20. Claim 14, 23, and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Downs et al.** (hereinafter, **Downs**, US 6,067,553) in view of **Gall** (US 6,480,862).

21. Regarding claim 14, **Downs** discloses **Downs** discloses a method for processing an Arbitrary Order Signal Sequence having a plurality of Objects and a plurality of Object References between said plurality of Objects [PDF standard], said method transforming said Arbitrary Order Signal Sequence [PDF] into a Streamable Signal Sequence [different structure] (See column 8, lines 57-63 "...and thus all object definitions within the file, before any of the object references can be used to draw an image on a graphical display unit. However, FIG. 7 shows an apparatus for re-organizing existing PDF files structured in the manner indicated in FIG. 5, into a file having a different structure, yet which remains compliant with the PDF standard." The "different structure" referred to is explained in greater detail and is clearly a Streamable Signal Sequence.), said method comprising:

determining a network of references between said plurality of Objects, said step of determining including identifying at least one Referenced Object [212] and a corresponding Referencing Object [211] containing an Object Reference to said Referenced Object [212] (See column 6, lines 52-57 "The catalogue object 211 contains references to other objects, such that the layout of the file's contents is defined. In the example shown, the catalogue object 211 contains a reference to another object 212, which in turn contains a reference to several page objects 213, 214, and 215..."); placing said Referenced Object in said Streamable Signal Sequence prior to said

corresponding Referencing Object, responsive to said determining step, to form said Streamable Signal Sequence. (See column 10, lines 39-43 "If the PDF statement is a reference to an object or a page, control is directed to process 854, where a question is asked as to whether the object or page has already been defined. If there is no existing definition for the object or page in the destination file, it will be necessary to define it before further progress is made." Defining the definition for the object, when it has not been defined previously, is equivalent to placing the referenced object prior to the referencing object.); said step of determining a network of references between said plurality of Objects including identifying at least one shared Referenced Object that is referenced by a first Referencing Object and a second Referencing Object, each of said first and second Referencing Objects containing an Object Reference to said shared Referenced Object (See column 6, lines 52-57 "The catalogue object 211 contains references to other objects, such that the layout of the file's contents is defined. In the example shown, the catalogue object 211 contains a reference to another object 212, which in turn contains a reference to several page objects 213, 214, and 215..."); generating Summary Information regarding at least one of said Referenced Object, said Referencing Object, said shared Referenced Object, said first Referencing Object, said second Referencing Object, said first replicated Referenced Object and said second replicated Referenced Object; (See column 7, lines 28 – 31 "Each object, such as the catalogue 211, page definitions 213 to 215 and other objects are stored in the file one after the other. The sequential nature of the file structure requires the use of a cross-reference table 'xref' 501..." The xref table has the identification for all of the objects in

the sequence.); and inserting said Summary Information into said Streamable Signal Sequence. (See figure 5, item 501, showing the location of the identification summary information within the file stream.)

Downs fails to teach replicating said shared Referenced Object into a first replicated Referenced Object and a second replicated Referenced Object; placing said first replicated Referenced Object in said Streamable Signal Sequence prior to said first Referencing Object in said Streamable Signal Sequence; placing said second replicated Referenced Object in said Streamable Signal Sequence prior to said second Referencing Object in said Streamable Signal Sequence;

However, **Gall** teaches replicating said shared Referenced Object into a first replicated Referenced Object and a second replicated Referenced Object; placing said first replicated Referenced Object in said Streamable Signal Sequence prior to said first Referencing Object in said Streamable Signal Sequence; placing said second replicated Referenced Object in said Streamable Signal Sequence prior to said second Referencing Object in said Streamable Signal Sequence. (See column 13, line 66 – column 14, line 5 "Block 226 handles the objects in the "order" list, essentially copying the objects referenced by each object in the "order" list into the To partition in the access order defined by the access order tree. In addition, at this time, a forwarding pointer is added to each original object in the From partition, which points to the new copy of that object in the To partition.")

It would have been obvious to one with ordinary skill in the art at the time of the invention to combine **Downs** with **Gall** because they are both in the field of optimizing

data objects and by including replicating the object and inserting into the data stream as disclosed in **Gall**, the method can become more efficient (although taking up more space) because the objects are closer to their referencing object. It is for this reason that one of ordinary skill in the art would have been motivated to include replicating said shared Referenced Object into a first replicated Referenced Object and a second Referenced Object; placing said first replicated Referenced Object in said Streamable Signal Sequence prior to said first Referencing Object in said Streamable Signal Sequence; and placing said second replicated Referenced Object in said Streamable Signal Sequence prior to said second Referencing Object in said Streamable Signal Sequence.

22. Regarding claim 23, **Downs** additionally discloses each of said Objects are PDF objects, and said each of said Object References is a PDF object is a PDF Object Identifier. (See column 10, lines 51-57 "If, at process 853, an object or page reference is not identified, control is directed to process 856, where a question is asked as to whether the current PDF statement defines the end of an object or page definition...Alternatively, control is directed to process 857, where the object or page identifier is written to the object cross reference table." Here, the source refers to the objects as PDF statements, and also refers to the object identifier.)

23. Regarding claim 24, **Downs** additionally discloses said Summary Information includes a PDF xref table (See column 7, lines 28 – 31 "Each object, such as the

catalogue 211, page definitions 213 to 215 and other objects are stored in the file one after the other. The sequential nature of the file structure requires the use of a cross-reference table 'xref' 501..." The xref table has the identification for all of the objects in the sequence.)

24. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over **Downs** in view of **Gall** as applied to claim 14 above and further in view of **Kuch** (US 6,862,729). **Downs** and **Gall** teach determining a network of references between said plurality of Objects including identifying at least one non-shared Referenced Object and a corresponding third Referencing Object [212] containing an Object Reference to said non-shared Referenced Object (See column 6, lines 52-57 "The catalogue object 211 contains references to other objects, such that the layout of the file's contents is defined. In the example shown, the catalogue object 211 contains a reference to another object 212, which in turn contains a reference to several page objects 213, 214, and 215...");

Downs and **Gall** fail to teach splitting said third Referencing Object into a fourth Referencing Object and a fifth Referencing Object such that the Object Reference to said non-shared Referenced Object is at the end of said third Referencing Object; and placing said non-shared Referenced Object between said fourth Referencing Object and said fifth Referencing Object created by said step of splitting said third Referencing Object in said Streamable Signal Sequence.

However, **Kuch** teaches splitting said third Referencing Object into a fourth Referencing Object and a fifth Referencing Object such that the Object Reference to said non-shared Referenced Object is at the end of said third Referencing Object (See column 15, line 66 – column 16 line 6 "A simple splitting technique simply specifies a threshold (e.g., percentage of references) and splits the data members of a class into two groups: A hot group and a cold group. If the profiling data indicates a particular data member has at least the threshold (e.g., percentage of the references), it is placed in the hot group; data members having less than the threshold...are placed in the cold group."); and placing said non-shared Referenced Object between said fourth Referencing Object and said fifth Referencing Object created by said step of splitting said third Referencing Object in said Streamable Signal Sequence. (See column 12, lines 57-60 "During execution, the class loader 812 arranges data members of the object in the memory system 822 by placing data members in the same group at neighboring locations in the memory system.")

It would have been obvious to one with ordinary skill in the art at the time of the invention to combine **Downs** and **Gall** with **Kuch** because they all relate to optimizing arrangements of objects and by including splitting the object and inserting into the data stream as disclosed in **Kuch**, the method can become more efficient because the objects are grouped together, closer to their referencing object. It is for this reason that one of ordinary skill in the art would have been motivated to include splitting said third Referencing Object into a fourth Referencing Object and a fifth Referencing Object such that the Object Reference to said non-shared Referenced Object is at the end of said

third Referencing Object; and placing said non-shared Referenced Object between said fourth Referencing Object and said fifth Referencing Object created by said step of splitting said third Referencing Object in said Streamable Signal Sequence.

25. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over **Downs** in view of **Gall** in view of **Kuch** as applied to claim 15 above and further in view of **Vondran** (US 2005/0094191). **Downs, Gall,** and **Kuch** teach a method substantially as claimed. **Downs, Gall,** and **Kuch** fail to teach generating Last Reference Summary Information about said Shared Referenced Object identifying the last of said first Referencing Object and said second Referencing Object in said Streamable Signal Sequence as corresponding to the last Referencing Object Signal containing an Object Reference to said Referenced Object; and inserting said Last Reference Summary Information into said Streamable Signal Sequence.

However, **Vondran** discloses generating Last Reference Summary Information [field] about said Shared Referenced Object identifying the last of said first Referencing Object and said second Referencing Object in said Streamable Signal Sequence as corresponding to the last Referencing Object Signal [references] containing an Object Reference to said Referenced Object; and inserting said Last Reference Summary Information into said Streamable Signal Sequence [cache]. (See page 3, paragraph [0025] "...extend the object table 36 to include a field associated with each unique entry (object) that holds a count of the number of occurrences of each unique entry encountered during the pre-processing of a print job or jobs. This corresponds to the

number of uses of each unique object. From this reuse information, the caching mechanism can make determinations as to the object caching priorities based on the number of uses and which objects may be drop from the cache because they have no further references.")

The motivation to combine the references comes from the common goal of modifying data streams for faster printing. It would have been obvious to one with ordinary skill in the art at the time of the invention to include the teachings of **Vondran** because by knowing when the last reference has been made to the object, the object can be removed, allowing for space to be freed up for other objects. It is for this reason that one of ordinary skill in the art would have been motivated to include generating Last Reference Summary Information about said Shared Referenced Object identifying the last of said first Referencing Object and said second Referencing Object in said Streamable Signal Sequence as corresponding to the last Referencing Object Signal containing an Object Reference to said Referenced Object; and inserting said Last Reference Summary Information into said Streamable Signal Sequence.

26. Claims 17 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Downs** in view of **Gall** as applied to claim 14 above and further in view of **Vondran** (US 2005/0094191).

27. Regarding claim 17, **Downs** and **Gall** teach a method substantially as claimed. **Downs** and **Gall** fail to disclose said Referenced Object is a non-shared referenced

Object, said method further comprising: generating Last Reference Summary Information about said Referenced Object identifying said Referencing Object in the Streamable Signal Sequence as corresponding to the last Referencing Object Signal containing an Object Reference to said Referenced Object; and inserting said Last Reference Summary Information into said Streamable Signal Sequence.

However, **Vondran** discloses said Referenced Object is a non-shared referenced Object [number of uses for this object = 1], said method further comprising: generating Last Reference Summary Information [field] about said Referenced Object identifying said Referencing Object in the Streamable Signal Sequence as corresponding to the last Referencing Object Signal [references] containing an Object Reference to said Referenced Object; and inserting said Last Reference Summary Information into said Streamable Signal Sequence. (See Vondran page 3, paragraph [0025] "...extend the object table 36 to include a field associated with each unique entry (object) that holds a count of the number of occurrences of each unique entry encountered during the pre-processing of a print job or jobs. This corresponds to the number of uses of each unique object. From this reuse information, the caching mechanism can make determinations as to the object caching priorities based on the number of uses and which objects may be drop from the cache because they have no further references.")

The motivation to combine the references comes from the common goal of modifying data streams for faster printing. It would have been obvious to one with ordinary skill in the art at the time of the invention to include the teachings of **Vondran** because by knowing when the last reference has been made to the object, the object

can be removed, allowing for space to be freed up for other objects. It is for this reason that one of ordinary skill in the art would have been motivated to include said Referenced Object is a non-shared referenced Object, said method further comprising: generating Last Reference Summary Information about said Referenced Object identifying said Referencing Object in the Streamable Signal Sequence as corresponding to the last Referencing Object Signal containing an Object Reference to said Referenced Object; and inserting said Last Reference Summary Information into said Streamable Signal Sequence.

28. Regarding claim 18, **Downs** and **Gall** discloses a method substantially as claimed. **Downs** and **Gall** fail to disclose wherein said Referenced Object is a non-shared Referenced Object from a corresponding Referencing Object, where said Referencing Object has an Object Reference from said Referencing Object to said Referenced Object, said method further comprising: said step of determining said network of references between said plurality of Objects, further includes the step of identifying the size of the portion of said Referencing Object following said Object Reference to said non-shared Referenced Object; and placing said Referenced Object in said Streamable Signal Sequence prior to said corresponding Referencing Object if said Referenced Object is smaller than said portion of said Referencing Object following said Object Reference to said non-shared Referenced Object, and placing said Referenced Object in said Streamable Signal Sequence after its corresponding Referencing Object if said Referenced Object is larger than said portion of said

Referencing Object following said Object Reference to said non-shared Referenced Object, to form said Streamable Signal Sequence.

However, **Vondran** discloses wherein said Referenced Object is a non-shared Referenced Object from a corresponding Referencing Object, where said Referencing Object has an Object Reference from said Referencing Object to said Referenced Object, said method further comprising: said step of determining said network of references between said plurality of Objects, further includes the step of identifying the size of the portion [size of the common objects] of said Referencing Object following said Object Reference to said non-shared Referenced Object; and placing said Referenced Object in said Streamable Signal Sequence prior to [top of the list] said corresponding Referencing Object if said Referenced Object is smaller than said portion of said Referencing Object following said Object Reference to said non-shared Referenced Object, and placing said Referenced Object in said Streamable Signal Sequence after its corresponding Referencing Object [incremented] if said Referenced Object is larger than said portion of said Referencing Object following said Object Reference to said non-shared Referenced Object, to form said Streamable Signal Sequence. (See page 3, paragraph [0027] "Each link is assigned a weight based on, for example, the number and/or size of the common objects between the link's two page nodes.", and see page 4, paragraph [0029] "a first link entry is selected and evaluated to determine whether its combined end node's page lists do not exceed the maximum partition size....If the number of clusters is less than the value held in partitions at step 90, then the numbers of clusters is incremented at step 91." and see page 4, paragraph

[0031] "repositioning of the updated links involves sorting from the currently selected link's position upward towards the top of the list.")

The motivation to combine the references comes from the common goal of modifying data streams for faster printing. It would have been obvious to one with ordinary skill in the art at the time of the invention to include the teachings of **Vondran** because the size restraints will only allow for the objects to be placed before if the object is small enough to fit there. It is for this reason that one of ordinary skill in the art would have been motivated to include wherein said Referenced Object is a non-shared Referenced Object from a corresponding Referencing Object, where said Referencing Object has an Object Reference from said Referencing Object to said Referenced Object, said method further comprising: said step of determining said network of references between said plurality of Objects, further includes the step of identifying the size of the portion of said Referencing Object following said Object Reference to said non-shared Referenced Object; and placing said Referenced Object in said Streamable Signal Sequence prior to said corresponding Referencing Object if said Referenced Object is smaller than said portion of said Referencing Object following said Object Reference to said non-shared Referenced Object, and placing said Referenced Object in said Streamable Signal Sequence after its corresponding Referencing Object if said Referenced Object is larger than said portion of said Referencing Object following said Object Reference to said non-shared Referenced Object, to form said Streamable Signal Sequence.

29. Claims 19, 20, and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Downs** in view of **Gall** as applied to claim 14 above and further in view of **Kuroki** (US 2004/0100656).

30. Regarding claim 19, **Downs** and **Gall** disclose a method substantially as claimed. **Downs** and **Gall** fail to disclose generating Memory Requirement Summary Information regarding the amount of memory required to process said Streamable Signal Sequence; and inserting said Memory Requirement Summary Information into said Streamable Signal. However, **Kuroki** discloses generating Memory Requirement Summary Information [size of the PDF after conversion] regarding the amount of memory required to process said Streamable Signal Sequence [converted PDF file] (See page 5, paragraph [0080] "Next, the size of the PDF after the conversion process is compared with the usable capacity of the memory of the printer 200, which is to be used for printing the PDF file..."); and inserting said Memory Requirement Summary Information into said Streamable Signal (See figure 21, item 502F, showing the summary information within the stream of data). It would have been obvious to one with ordinary skill in the art at the time of the invention to combine **Downs** and **Gall** with **Kuroki** because they are both in the field of optimizing data streams relating to PDF files and by adding memory summary information as disclosed in **Kuroki** to the stream, a data overrun can be avoided providing for a more fault tolerant method. It is for this reason that one of ordinary skill in the art would have been motivated to include generating Memory Requirement Summary Information regarding the amount of

memory required to process said Streamable Signal Sequence; and inserting said Memory Requirement Summary Information into said Streamable Signal.

31. Regarding claim 20, **Downs** and **Gall** discloses generating identification Summary Information to identify said Streamable Signal Sequence (See **Downs**, column 7, lines 28 – 31 "Each object, such as the catalogue 211, page definitions 213 to 215 and other objects are stored in the file one after the other. The sequential nature of the file structure requires the use of a cross-reference table 'xref' 501..." The xref table has the identification for all of the objects in the sequence.); and inserting said identification Requirement Summary Information into said Streamable Signal (See figure 5, item 501, showing the location of the identification summary information within the file stream.)

32. Regarding claim 22, **Downs** and **Gall** discloses said Arbitrary Order Signal sequence is a Portable Document Format (PDF) file. (See **Downs** column 8, lines 57-63 "...and thus all object definitions within the file, before any of the object references can be used to draw an image on a graphical display unit. However, FIG. 7 shows an apparatus for re-organizing existing PDF files structured in the manner...").

Downs and **Gall** fail to disclose, said method further comprising: generating identification Summary Information to identify said Streamable Signal Sequence as a streamable PDF file; and inserting said identification Summary Information into said Streamable Signal.

However, **Kuroki** discloses said method further comprising: generating identification Summary Information [PDF.1.4] to identify said Streamable Signal Sequence as a streamable PDF file; and inserting said identification Summary Information into said Streamable Signal. (See FIG. 5, item 510 where the identification information, is shown located at the top of the streamable signal.) It would have been obvious to one with ordinary skill in the art at the time of the invention to combine **Downs** and **Gall** with **Kuroki** because they are both in the field of optimizing data streams relating to PDF files and by adding identification information as disclosed in **Kuroki** to the stream, the receiving device can still recognize the data as a PDF format, allowing for compatibility. It is for this reason that one of ordinary skill in the art would have been motivated to include said method further comprising: generating identification Summary Information [PDF.1.4] to identify said Streamable Signal Sequence as a streamable PDF file; and inserting said identification Summary Information into said Streamable Signal.

33. Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over **Downs** in view of **Gall** as applied to claim 14 above, and further in view of **Rowe et al.** (hereinafter Rowe, US 5,781,785). **Downs** and **Gall** disclose a method substantially as claimed. **Downs** and **Gall** fail to disclose generating non-shared Summary Information to indicate that all Objects in said Streamable Signal Sequence are non-shared and inserting said non-shared Summary Information into said Streamable Signal. However, **Rowe** discloses generating non-shared Summary Information [internal list] to indicate

that all Objects in said Streamable Signal Sequence are non-shared (See column 3, lines 40-43 "To provide the page contents and shared objects contiguously in the file, an internal list of non-shared objects and shared objects in the document file is created."); and inserting said non-shared Summary Information into said Streamable Signal. (See column 15, lines 29-34 "If the retrieved object is not a shared object...the object ID of the retrieved object is added to the end of the internal list. The internal list thus has an order of objects including a page object followed b all the objects (in the designated order) referenced by that page.") It would have been obvious to one with ordinary skill in the art at the time of the invention to combine **Downs** and **Gall** with **Rowe** because they are both in the field of optimizing data streams relating to PDF files and by including a list of non-shared objects as disclosed in **Rowe** to the stream, storage can be saved by removing them as soon as they are used. It is for this reason that one of ordinary skill in the art would have been motivated to include disclose generating non-shared Summary Information to indicate that all Objects in said Streamable Signal Sequence are non-shared and inserting said non-shared Summary Information into said Streamable Signal.

34. Claim 26 is rejected under 35 U.S.C. 103(a) as being unpatentable over **Downs** in view of **Vondran. Downs** discloses a method for processing a Streamable Signal Sequence having a plurality of Objects and a plurality of Object References between said plurality of Objects and including at least one shared Referenced Object having a first Object Reference from a first Referencing Object and a second Object Reference

from a second Referencing Object to said Shared Referenced Object (See column 12, lines 3 – 5 "Furthermore, objects defined within a page, such as a font object, need only be defined once in a while, and thereafter used in any page within that file." Any of the other objects in the file that reference the font object would be a first or second referencing object.); said Streamable Signal Sequence further having said Shared Referenced Object placed prior to either of said first Referencing Object and said second Referencing Object (See column 11, lines 58-61 "Reading from the start of the file shown in FIG. 11, it may be seen that definitions of objects which are referred to in page definition 213 are defined before page 213." By defining them before, the object is placed prior in the signal sequence.)

Downs fails to disclose said Streamable Signal Sequence further comprising Last Reference Summary Information about said Shared Referenced Object identifying the last of said first Referencing Object and said second Referencing Object in said Streamable Signal Sequence as corresponding to the last Referencing Object Signal containing an Object Reference to said Shared Referenced Object; said method comprising: receiving said Shared Referenced Object and said Last Reference Summary Information; storing said Shared Referenced Object in a memory; processing said first Referencing Object containing said Object Reference to said Shared Referenced Object; processing said second Referencing Object containing said Object Reference to said Shared Referenced Object; and deleting, responsive to Last Reference Summary Information, said Shared Referenced Object from said memory.

However, **Vondran** discloses Streamable Signal Sequence further comprising Last Reference Summary Information about said Shared Referenced Object identifying the last of said first Referencing Object and said second Referencing Object in said Streamable Signal Sequence as corresponding to the last Referencing Object Signal containing an Object Reference to said Shared Referenced Object; said method comprising: receiving said Shared Referenced Object and said Last Reference Summary Information; storing [holds a count] said Shared Referenced Object in a memory; processing said first Referencing Object [pre-processing] containing said Object Reference to said Shared Referenced Object; processing said second Referencing Object containing said Object Reference to said Shared Referenced Object (See Vondran page 3, paragraph [0025] "...extend the object table 36 to include a field associated with each unique entry (object) that holds a count of the number of occurrences of each unique entry encountered during the pre-processing of a print job or jobs. This corresponds to the number of uses of each unique object. From this reuse information, the caching mechanism can make determinations as to the object caching priorities based on the number of uses and which objects may be drop from the cache because they have no further references."); and deleting [dropped from the cache], responsive to Last Reference Summary Information, said Shared Referenced Object from said memory (See page 3, paragraph [0025] "...objects may be dropped from the cache because they have no further references.")

The motivation to combine the references comes from the common goal of modifying data streams for faster printing. It would have been obvious to one with

ordinary skill in the art at the time of the invention to include the teachings of **Vondran** because by knowing when the last reference has been made to the object, the object can be removed, allowing for space to be freed up for other objects. It is for this reason that one of ordinary skill in the art would have been motivated to include said Streamable Signal Sequence further comprising Last Reference Summary Information about said Shared Referenced Object identifying the last of said first Referencing Object and said second Referencing Object in said Streamable Signal Sequence as corresponding to the last Referencing Object Signal containing an Object Reference to said Shared Referenced Object

Conclusion

35. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Sugimoto et al. (US 2004/0143794) Teaches deleting completed objects and objects no longer needed for other pages. (page 6)

deBry et al. (US 6,538,760) – Teaches converting PDF files to a bi-directional print stream.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dennis L. Vautrot whose telephone number is 571-272-2184. The examiner can normally be reached on Monday-Friday 8:30-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Cottingham can be reached on 571-272-7079. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Dv
29 August 2006

JOHN COTTINGHAM
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2100

1 September 2006